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REMARKS

The Office Action of March 21, 2006 has been carefully considered.

The invention relates to a method for packet processing for data transmission over an optical fiber. As now recited in amended claim 17, the method includes receiving *at least two* incoming bit streams of data, each containing one service, segmenting each bit streams in its original protocol into variable length segments, adding a tag to each segment with each tag including data identifying a route between a source and a destination end-point of its bit stream, and processing the tagged segments from the bit streams into a single transmission frame for transmission. The concept of combining data from at least two bit streams is supported in the specification at page 8, lines 1-7, in particular in the statement that "various services according to differing protocols are processed in the same fashion by segmenting their bit streams and encapsulating the segments, without regard to content, with final transport as a seemingly-conventional PoS or similar transmission frame."

Applicants have thus invented a method for combining two or more bit streams of data, and which enables multiplexing different services into a single bit stream. The heart of the invention lies in the formation of new units which can be manipulated as if they were conventional packets for purposes of encapsulation, routing, and transmission on a communications network (see page 6, lines 4-7), even though they are clearly not conventional packets. Each of the new packets according to the invention includes segments of at least two bit streams in their original protocols (page 3, lines 23-25). These bit streams can be of the same services and, thus, in the same protocol, or can be of different

services and, thus, in different protocols (page 7, lines 19-22).

An engine for carrying out this method is claimed in amended claim 19, and includes at least two service ports, each for receiving an incoming bit stream of data.

Conventional packets are known only for certain data services, particularly Ethernet and Fibre Channel packets. Other services are divided in different fashions. For example, TDM services are divided into time slots, and ATM services are divided into cells. As stated in the Background of the Invention (page 1, lines 16-19), at present, data according to each protocol must be transmitted via its own network, and data at different bit rates must be transmitted separately or processed before being transmitted simultaneously with data at other data rates and/or types over a higher bit rate medium. Thus, in conventional methods, utilization of bandwidth during transmission of various services over a common optical fiber system is inefficient, as not all the bandwidth is utilized due to empty portions of packets, time slots, and/or cells, etc.

The invention, by creating special packets, permits one or more services, in their original protocols, coming from at least two bit streams, to be divided up into different size units, so that "empty" spaces on the bandwidth can be filled. This increases the efficiency of the overall system (see page 3, lines 20-22), and is not disclosed or suggested by any of the cited references. This method permits the data received in a variety of different protocols from a variety of different services to be combined into packets without regard to their original protocols. In addition, except for TDM services which require synchronization, even single services can be segmented into smaller units for more efficient

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utilization of network resources than is possible at present.

Claims 1-11 and 17-18 have been rejected under 35 USC 112, 1st paragraph, as containing subject matter not described in the specification. In particular, the Office Action states that the specification as originally filed does not describe segmenting a bit stream in accordance with available transmission bandwidth (claim 17), and does not describe a bit stream of data comprising at least two services (claim 18).

In order to advance prosecution, Applicants have canceled from claim 17 the phrase "whereby utilization of available bandwidth capacity is optimized." References to bandwidth have also been canceled from claims 18 and 19, and claim 18 has been amended to correctly recite that *two* of bit streams contain different services.

Nevertheless, Applicants point out that on page 3, lines 20-22, of the specification, it is stated that the packet processing system of the invention optimizes usage of the bandwidth capacity of optical fibers, and this concept is thought to be disclosed sufficiently that one of ordinary skill in the art could optimize bandwidth utilizing the invention.

Claims 1, 3, 4, 7-10, 12-16 and 17-19 have been rejected under 35 USC 102(e) as anticipated by US 6,331,978 to Ravikanth. The Office Action alleges that Ravikanth discloses a method for packet processing comprising adding a label to the front of a datagram, where adding a label is interpreted as adding a tag, and where the datagram is interpreted as a segment. The presence of a datagram has also been interpreted as being preceded by a form of segmentation of a bit stream of data of at least one service. Regarding claim 18, the Office Action alleges that Ravikanth implicitly discloses receiving a

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datagram of multiple services, pointing to column 5, lines 14-17.

The patent to Ravikanth relates to a generic label encapsulation protocol for carrying IP packets (packet-based services). This protocol utilizes datagrams, which are pre-formed conventional data packets. While the presence of a datagram indicates formation of packets of at least one service, Ravikanth does not disclose or suggest receiving two or more incoming bit streams, each including one service, and segmenting the bit streams in their original protocols into variable length segments, before adding an identifying tag and processing the segment for transmission. On the contrary, the packet based services which are provided as datagrams in Ravikanth can be segmented according to the claimed invention and formed into the specialized packets of the invention, alone or with other types of services.

Those of ordinary in the art will appreciate that there is a distinction between types of services and protocol layers which deal with or treat those services. The following chart illustrates this schematically.

Service Type	Packet based data services	Voice Services	Video streaming services	Storage Services	Fibre Channel Services
Protocol layers	Ethernet	TDM	RTP		
	IP	SONET	RTSP		
	MPLS				

Ravikanth deals only with Ethernet services which are sent via IP protocol. He cannot include voice services, video streaming services, storage services, or fibre channel services, for example, since they are not label switched packets. Thus, he can send Ethernet services from any protocol layer (e.g., IP, MPLS), but not different services.

The claimed invention, on the other hand, is a method for

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multiplexing (combining together) a plurality of different bit streams and services into a single packet. Thus, segments of bit streams of voice services can be combined with segments of bit streams of video streaming services and with segments of bit streams of Ethernet services. This capability is not provided by any art known to the Applicants or cited by the Examiner, including Ravikanth, and clearly distinguishes the invention from the prior art.

Accordingly, it is respectfully submitted that amended claims 17 and 19, as well as claims 1, 3, 4, 7-10, 12-16 and 18 are novel in view of Ravikanth, and withdrawal of this rejection is requested.

Claims 2, 5, 6, 11 have been rejected under 35 USC 103(a) as being obvious over Ravikanth in view of the article to Ndousse. The Office Action alleges that Ravikanth fails to disclose the use of HDLC frames, which are disclosed by Ndousse.

Ravikanth and Ndousse both relate to using packets over SONET/SDH. The patent to Ravikanth has been discussed in detail above. The Ndousse article on PPP Extensions examines the dynamics of IP traffic over SONET/SDH using PPP in HDLC-like framing. There is no disclosure or suggestion in Ndousse of the method of forming specialized packets from two or more bit streams, as claimed in amended claim 17. Applicants are not claiming encapsulating a packet into a PPP-HDLC frame, *per se*, but only in the context of the method of claim 17.

Withdrawal of this rejection is requested.

The Response to Arguments points to the non-limiting Example in the application which utilizes an Ethernet frame as a "segment" for purposes of creating a specialized packet. The segments according to the invention can have a variable length between and within a particular service, as disclosed at page

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6, lines 11-16. Thus, while the length of the bit stream selected for a segment may be the length of an Ethernet frame in its entirety, the bit stream can also be cut into segments of smaller or larger size than an Ethernet frame, starting at the beginning or in the middle of the frame, as desired at the time. In this way, the length of the segments may be determined at the time of filling the transmission frames so as to fill, as completely as possible, the bandwidth in each frame.

The Office Action states that the specification does not support cutting a frame into several segments. This is correct; the specification does, however, support *segmenting a bit stream* into variable length segments which, as stated above, may or may not start or end in the same place as an Ethernet frame, or a TDM time slot or an ATM cell.

In view of the foregoing amendments and remarks, Applicants submit that the present application is now in condition for allowance. An early allowance of the application with amended claims is earnestly solicited.

Respectfully submitted,

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